SEQUENCE SEARCH RESULTS

08/461652

checked JC

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Title:           >US-08-461-652-1
Description:     (1:838) from US08461652.seq
Perfect Score:   838
N.A. Sequence:       1
AATCAGCTTTGCTAGTATCA.........AATAGGGCTGTTGGGACTTT 838
     Comp:
TTAGTCGAAACGATCATAGT.........TTATCCCGACAACCCTGAAA

                                ALIGNMENTS

RESULT    1
LOCUS       HSU03397     1415 bp    mRNA            PRI
15-NOV-1994
DEFINITION  Human receptor protein 4-1BB mRNA, complete cds.
ACCESSION   U03397
KEYWORDS    .
SOURCE      human.
  ORGANISM  Homo sapiens
            Eucaryotae; Metazoa; Chordata; Vertebrata;
Gnathostomata; Mammalia;
            Eutheria; Primates; Catarrhini; Hominidae; Homo.
REFERENCE   1  (bases 1 to 1415)
  AUTHORS   Alderson,M.R., Smith,C.A., Tough,T.W.,
Davis-Smith,T.,
            Armitage,R.J., Falk,B., Roux,E., Baker,E.,
Sutherland,G.R.,
            Din,W.S. and Goodwin,R.G.
  TITLE     Molecular and biological characterization of human
4-1BB and its
            ligand
  JOURNAL   Eur. J. Immunol. 24 (9), 2219-2227 (1994)
  MEDLINE   94374434
REFERENCE   2  (bases 1 to 1415)
  AUTHORS   Alderson,M.
  TITLE     Direct Submission
  JOURNAL   Submitted (10-NOV-1993) Mark Alderson, Immunex
Research and
            Development Corp., 51 University St., Seattle, WA
98101, USA
COMMENT     NCBI gi: 571320
FEATURES             Location/Qualifiers
     source          1..1415
                     /organism="Homo sapiens"
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/tissue_type="peripheral blood"
/cell_type="T cell"
CDS 120..887
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homolog of murine T-cell receptor 4-1BB protein;
transmembrane protein; NCBI gi: 571321"
/codon_start=1
/product="4-1BB"

/translation="MGNSCYNIVATLLLVLNFERTRSLQDPCSNCPAGTFCDNNRNQI

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SPADLSPGASSVTPPAPAREPGHSPQIISFFLALTSTALLFLLFFLTLRFSVVKRGRK
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misc_feature 531..533
/note="encodes potential glycosylation site"
misc_feature 564..566
/note="encodes potential glycosylation site"
misc_feature 678..758
/note="encodes transmembrane domain; amino acids 187-208"
BASE COUNT 385 a 332 c 333 g 365 t
ORIGIN

DB 110; Score 836; Match 99.9%; QryMatch 99.8%; Pred. No. 0.00e+00;
Matches 837; Conservative 0; Mismatches 1; Indels 0; Gaps 0;

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Db     80
aatcagctttgctagtatcatacctgtgccagatttcatcatgggaaacagctgttacaa 139

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Qy      1
AATCAGCTTTGCTAGTATCATACCTGTGCCAGATTTCATCATGGGAAACAGCTGTTACAA 60

Db    140
catagtagccactctgttgctggtcctcaactttgagaggacaagatcattgcaggatcc 199

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Qy     61
CATAGTAGCCACTCTGTTGCTGGTCCTCAACTTTGAGAGGACAAGATCATTGCAGGATCC 120

Db    200
ttgtagtaactgcccagctggtacattctgtgataataacaggaatcagatttgcagtcc 259

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Qy    121
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Db     260
ctgtcctccaaatagtttctccagcgcaggtggacaaaggacctgtgacatatgcaggca 319

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Qy     181
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Db     320
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Qy     241
GTGTAAAGGTGTTTTCAGGACCAGGAAGGAGTGTTCCTCCACCAGCAATGCAGAGTGTGA 300

Db     380
ctgcactccagggtttcactgcctgggggcaggatgcagcatgtgtgaacaggattgtaa 439

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CTGCACTCCAGGGTTTCACTGCCTGGGGGCAGGATGCAGCATGTGTGAACAGGATTGTAA 360

Db     440
acaaggtcaagaactgacaaaaaaaggttgtaaagactgttgctttgggacatttaacga 499

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Qy     361
ACAAGGTCAAGAACTGACAAAAAAAGGTTGTAAAGACTGTTGCTTTGGGACATTTAACGA 420

Db     500
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Qy     421
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Db     560
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          ||||||||||||||||||||||||||||||||||||||||||||||||||||
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Qy     481
TGTGAATGGGACGAAGGAGAGGGACGTGGTCTGTGGACCATCTCCAGCTGACCTCTCTCC 540

Db     620
gggagcatcctctgtgaccccgcctgcccctgcgagagagccaggacactctccgcagat 679

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Qy     541
GGGAGCATCCTCTGTGACCCCGCCTGCCCCTGCGAGAGAGCCAGGACACTCTCCGCAGAT 600

Db     680
catctccttctttcttgcgctgacgtcgactgcgttgctcttcctgctgttcttcctcac 739

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Qy     601
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CATCTCCTTCTTTCTTGCGCTGACGTCGACTGCGTTGCTCTTCCTGCTGTTCTTCCTCAC 660

Db    740
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Qy    661
GCTCCGTTTCTCTGTTGTTAAACGGGGCAGAAAGAAACTCCTGTATATATTCAAACAACC 720

Db    800
atttatgagaccagtacaaactactcaagaggaagatggctgtagctgccgatttccaga 859

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Qy    721
ATTTATGAGACCAGTACAAACTACTCAAGAGGAAGATGGCTGTAGCTGCCGATTTCCAGA 780

Db    860
agaagaagaaggaggatgtgaactgtgaaatggaagtcaatagggctgttgggacttt 917

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Qy    781
AGAAGAAGAAGGAGGATGTGAACTGTGAAATGGAAGTCAATAGGGCTGTTGGGACTTT 838


RESULT    2
LOCUS       HUMILAX      1419 bp    mRNA            PRI
28-FEB-1995
DEFINITION  Human activation dependent T cell mRNA, complete cds.
ACCESSION   L12964
KEYWORDS    cell surface receptor; nerve growth factor receptor;
            human 4-1BB  homologue; tumor necrosis factor
receptor.
SOURCE      Homo sapiens cDNA to mRNA.
  ORGANISM  Homo sapiens
            Eukaryota; Animalia; Chordata; Vertebrata; Mammalia;
Theria;
            Eutheria; Primates; Haplorhini; Catarrhini;
Hominidae.
REFERENCE   1  (bases 1 to 1419)
  AUTHORS   Schwarz,H., Tuckwell,J. and Lotz,M.
  TITLE     A receptor induced by lymphocyte activation (ILA): a
new member of
            the human nerve-growth-factor/tumor-necrosis-factor
receptor family
  JOURNAL   Gene 134 (2), 295-298 (1993)
  MEDLINE   94085794
REFERENCE   2  (bases 1 to 1419)
  AUTHORS   Schwarz,and H. and H.,TITLE     Direct Submission.
  TITLE     Direct Submission
  JOURNAL   Submitted (22-APR-1993) Schwarz H., Sam and Rose
Stein Institute
            for Research on Aging, University of California, San
Diego,  La
            Jolla, CA 92093-0663, USA
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COMMENT     NCBI gi: 292237
FEATURES             Location/Qualifiers
     source          1..1419
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                     /cell_type="transformed T lymphocyte"
                     /cell_line="SLB-1"
                     /sequenced_mol="cDNA to mRNA"
     5'UTR           1..139
     CDS             140..907
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                     /note="ILA= induced by lymphocyte
activation; similar to
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Accession Number
                     U03397;  NCBI gi: 292238"
                     /codon_start=1

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CSPCPPNSFSSAGGQRTCDICRQCKGVFRTRKECSSTSNAECDCTPGFHCLGAGCSMC

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SPADLSPGASSVTPPAPAREPGHSPQIISFFLALTSTALLFLLFFLTLRFSVVKRGRK
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     3'UTR           908..1419
     polyA_signal    1369..1374
     polyA_site      1419
BASE COUNT      373 a    340 c    342 g    364 t
ORIGIN

  DB 113;  Score     830;  Match 99.5%;  QryMatch 99.0%;  Pred.
No. 0.00e+00;
  Matches   834;  Conservative    0;  Mismatches   4;  Indels
0;  Gaps   0;

Db    100
aatcagctttgctagtatcatacctgtcgcagatttcatcatgggaaacagctgttacaa 159
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Qy      1
AATCAGCTTTGCTAGTATCATACCTGTGCCAGATTTCATCATGGGAAACAGCTGTTACAA 60

Db    160
catagtagccactctgttgctggtcctcaactttgagaggacaagatcattgcaggatcc 219

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Qy     61
CATAGTAGCCACTCTGTTGCTGGTCCTCAACTTTGAGAGGACAAGATCATTGCAGGATCC 120

Db    220
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Qy    121
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Db    280
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Qy    181
CTGTCCTCCAAATAGTTTCTCCAGCGCAGGTGGACAAAGGACCTGTGACATATGCAGGCA 240

Db    340
gtgtaaaggtgttttcaggaccaggaaggagtgttcctccaccagcaatgcagagtgtga 399

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Qy    241
GTGTAAAGGTGTTTTCAGGACCAGGAAGGAGTGTTCCTCCACCAGCAATGCAGAGTGTGA 300

Db    400
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Qy    301
CTGCACTCCAGGGTTTCACTGCCTGGGGGCAGGATGCAGCATGTGTGAACAGGATTGTAA 360

Db    460
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Qy    361
ACAAGGTCAAGAACTGACAAAAAAAGGTTGTAAAGACTGTTGCTTTGGGACATTTAACGA 420

Db    520
tcagaaacgtggcatctgtcgaccctggacaaactgttctttggatggaaagtctgtgct 579

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Qy    421
TCAGAAACGTGGCATCTGTCGACCCTGGACAAACTGTTCTTTGGATGGAAAGTCTGTGCT 480

Db    580
tgtgaatgggacgaaggagagggacgtggtctgtggaccatctccagccgacctctctcc 639
          ||||||||||||||||||||||||||||||||||||||||||||||||||||||
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Qy    481
TGTGAATGGGACGAAGGAGAGGGACGTGGTCTGTGGACCATCTCCAGCTGACCTCTCTCC 540

Db    640
gggagcatcctctgtgaccccgcctgcccctgcgagagagccaggacactctccgcagat 699

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Qy    541
GGGAGCATCCTCTGTGACCCCGCCTGCCCCTGCGAGAGAGCCAGGACACTCTCCGCAGAT 600

Db    700
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Qy    601
CATCTCCTTCTTTCTTGCGCTGACGTCGACTGCGTTGCTCTTCCTGCTGTTCTTCCTCAC 660

Db    760
gctccgtttctctgttgttaaacggggcagaaagaaactcctgtatatattcaaacaacc 819

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Qy    661
GCTCCGTTTCTCTGTTGTTAAACGGGGCAGAAAGAAACTCCTGTATATATTCAAACAACC 720

Db    820
atttatgagaccagtacaaactactcaagaggaagatggctgtagctgccgatttccaga 879

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Qy    721
ATTTATGAGACCAGTACAAACTACTCAAGAGGAAGATGGCTGTAGCTGCCGATTTCCAGA 780

Db    880
agaagaagaaggaggatgtgaactgtgaaatggaagtcaatagggctgttgggacttt 937

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Qy    781
AGAAGAAGAAGGAGGATGTGAACTGTGAAATGGAAGTCAATAGGGCTGTTGGGACTTT 838


RESULT    3
LOCUS       MUSTC41BB    2350 bp    mRNA            ROD
15-SEP-1989
DEFINITION  Mouse T-cell receptor 4-1BB protein mRNA, complete
cds.
ACCESSION   J04492
KEYWORDS    T-cell receptor.
SOURCE      Mouse (strain C57BL/6) T-lymphocyte cell lines L2 and
L3, cDNA to
            mRNA.
  ORGANISM  Mus musculus
            Eukaryota; Animalia; Chordata; Vertebrata; Mammalia;
Theria;
            Eutheria; Rodentia; Myomorpha; Muridae; Murinae.
REFERENCE   1  (bases 1 to 2350)
  AUTHORS   Kwon,B.S. and Weissman,S.M.
  TITLE     cDNA sequences of two inducible T-cell genes
  JOURNAL   Proc. Natl. Acad. Sci. U.S.A. 86, 1963-1967 (1989)
  MEDLINE   89184547
COMMENT     Draft entry and clean copy of sequence for [1] kindly
provided by
            B.S.Kwon, 17-MAR-1989.

            NCBI gi: 201121
FEATURES             Location/Qualifiers
     source          1..2350
                     /organism="Mus musculus"
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                     /note="4-1BB protein precursor;  NCBI gi:
201122"
                     /codon_start=1

/translation="MGNNCYNVVVIVLLLVGCEKVGAVQNSCDNCQPGTFCRKYNPVC

KSCPPSTFSSIGGQPNCNICRVCAGYFRFKKFCSSTHNAECECIEGFHCLGPQCTRCE

KDCRPGQELTKQGCKTCSLGTFNDQNGTGVCRPWTNCSLDGRSVLKTGTTEKDVVCGP

PVVSFSPSTTISVTPEGGPGGHSLQVLTLFLALTSALLLALIFITLLFSVLKWIRKKF
                     PHIFKQPFKKTTGAAQEEDACSCRCPQEEEGGGGGYEL"
     mat_peptide     215..913
                     /note="4-1BB protein"
                     /codon_start=1
BASE COUNT      590 a    561 c    589 g    607 t      3 others
ORIGIN      Unreported.

  DB 120;  Score     235;  Match 69.2%;  QryMatch 28.0%;  Pred.
No. 4.34e-294;
  Matches   531;  Conservative    0;  Mismatches 224;  Indels
12;  Gaps   9;

Db    138
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Qy     33
ATTTCATCATGGGAAACAGCTGTTACAACATAGTAGCCACTCTGTTGCTGGTCCTCAACT 92

Db    198
gtgagaaggtgggagccgtgcagaactcctgtgataactgtcagcctggtactttctgc- 256
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|||||
Qy     93
TTGAGAGGACAAGATCATTGCAGGATCCTTGTAGTAACTGCCCAGCTGGTACATTCTGTG 152

Db    257
agaa-aatacaatccag-tctgcaagagctgccctccaagtaccttctccagcataggtg 314
          | || || |  |  ||| | ||||    ||| ||||||| ||  |||||||||
|||||
Qy    153
ATAATAACAGGAATCAGATTTGCAGTCCCTGTCCTCCAAATAGTTTCTCCAGCGCAGGTG 212

Db    315
gacagccgaactgtaacatctgcagagtgtgtgcaggctatttcaggttcaagaagtttt 374
          ||||   || |||| |||| |||||   ||||  |||   |||||||  ||
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Qy    213
GACAAAGGACCTGTGACATATGCAGGCAGTGTAAAGGTGTTTTCAGGACCAGGAAGGAGT 272
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Db    375
gctcctctacccacaacgcggagtgtgagtgcattgaaggattccattgcttggggccac 434
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Qy    273
GTTCCTCCACCAGCAATGCAGAGTGTGACTGCACTCCAGGGTTTCACTGCCTGGGGGCAG 332

Db    435
agtgcaccagatgtgaaaaggactgcaggcctggccaggagctaacgaagcagggttgca 494
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Qy    333
GATGCAGCATGTGTGAACAGGATTGTAAACAAGGTCAAGAACTGACAAAAAAAGGTTGTA 392

Db    495
aaacctgtagcttgggaacatttaatgaccagaacggtactggcgtctgtcgaccctgga 554
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Qy    393
AAGACTGTTGCTTTGGGACATTTAACGATCAGAAACGT---GGCATCTGTCGACCCTGGA 449

Db    555
cgaactgctctctagacggaaggtctgtgcttaagaccgggaccacggagaaggacgtgg 614
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Qy    450
CAAACTGTTCTTTGGATGGAAAGTCTGTGCTTGTGAATGGGACGAAGGAGAGGGACGTGG 509

Db    615
tgtgtggacccccctgtgg-tgagct-tctctcccagta-ccaccatttctgtgactccag 671
          | |||||||| ||   | ||| || ||||    || | || |  |  |   |
|| |
Qy    510
TCTGTGGACCATCTCCAGCTGACCTCTCTCCGGGAGCATCCTCTGTGACCCCGCCTGCCC 569

Db    672
agggaggaccaggagggcactccttgcaggtccttaccttgttcctggcgctgacatcgg 731
            |   ||     ||| |||||   |||| || |  |||| || || ||||||||
|||
Qy    570
CTGCGAGAGAGCCAGGACACTCTCCGCAGATCATCTCCTTCTTTCTTGCGCTGACGTCGA 629

Db    732
ctttgctgctgg-cc--ctgatcttcattactctcctgttctctgtgctcaaatggatca 788
          ||  | ||||   ||  ||| ||||| | || ||||  ||||||||  | |||
||  ||
Qy    630
CTGCGTTGCTCTTCCTGCTGTTCTTCCTCACGCTCCGTTTCTCTGTTGTTAAACGGGGCA 689

Db    789
ggaaaaaattcccccacatattcaagcaaccatttaagaagaccactggagcagctcaag 848
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||||||
Qy    690
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GAAAGAAACTCCTGTATATATTCAAACAACCATTTATGAGACCAGTACAAACTACTCAAG 749

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Db     849 aggaagatgcttgtagctgccgatgtccacaggaagaagaaggagga 895
           |||||||||  |||||||||||||| |||| | ||||||||||||||| 
Qy     750 AGGAAGATGGCTGTAGCTGCCGATTTCCAGAAGAAGAAGAAGGAGGA 796
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QUERY SEARCH

08/461652

Set	Items	Description
S1	14628180	HUMAN
S2	17	4-1BB
S3	12	S1 AND S2
S4	871550	RECEPTOR
S5	12	S3 AND S4

chedad 55

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      Set   Items  Description
       ---  -----  -----------
?s human

      S114628180  HUMAN
?s 4-1BB

      S2       17  4-1BB
?S S1 ANS S2

>>>Term "ANS" in invalid position
?S S1 AND S2

        14628180  S1
              17  S2
      S3      12  S1 AND S2
?S RECEPTOR

      S4  871550  RECEPTOR
?S S3 AND S4

              12  S3
          871550  S4
      S5      12  S3 AND S4
?SET HI ON

HILIGHT set on as '*'
?D S5/9,KWIC/1-12

      Display 5/9,KWIC/1     (Item 1 from file: 154)
DIALOG(R)File 154:MEDLINE(R)
(c) format only 1996 Knight-Ridder Info. All rts. reserv.

08855844   94170844
   The *human* OX40 homolog: cDNA structure, expression and chromosomal
assignment of the ACT35 antigen.
  Latza U; Durkop H; Schnittger S; Ringeling J; Eitelbach F; Hummel M;
Fonatsch C; Stein H
  Institute of Pathology, Free University of Berlin, FRG.
  Eur J Immunol (GERMANY)   Mar 1994,  24 (3) p677-83,  ISSN 0014-2980
Journal Code: EN5
  Languages: ENGLISH
  Document type: JOURNAL ARTICLE
  JOURNAL ANNOUNCEMENT: 9406
  Subfile:   INDEX MEDICUS
  Tissue distribution and expression on mitogen and virally stimulated
lymphocytes render the ACT35 molecule a *human* lymphocyte activation
antigen which as yet could not be clustered. Expression cloning of the
ACT35 antigen from a pCDM8 library of the HUT-102 cell line revealed strong

                                    -more-
?

      Display 5/9,KWIC/1     (Item 1 from file: 154)
DIALOG(R)File 154:MEDLINE(R)
(c) format only 1996 Knight-Ridder Info. All rts. reserv.
homology of the cDNA and its encoded protein sequence with the formerly
described rat OX40 antigen. The 1.4-kb nucleotide sequence and the deduced
```

277-amino acid sequence of the single transmembrane protein were 65% and 63% identical, in *human* and in rat, respectively. Conservation included one N-linked glycosylation site and one protein kinase C phosphorylation site. When expressed in COS-1 cells, the cDNA presented properties comparable to the native ACT35 antigen and the rat OX40 molecule (relative molecular mass 48,000). Thus, the ACT35 protein corresponds to the hitherto unknown *human* OX40 antigen and is, therefore, another member of the tumor necrosis factor/nerve growth factor *receptor* (TNFR/NGFR) family. After applying fluorescence in situ hybridization, the *human* ACT35/OX40 gene could be mapped to chromosome band 1p36 and is, thus, linked to the genes for TNFR II and CD30.

Tags: Comparative Study; *Human*; Support, Non-U.S. Gov't

Descriptors: *Antigens, CD--Genetics--GE; *Antigens, CD27--Genetics--GE; Amino Acid Sequence; Antigens, CD--Chemistry--CH; Antigens, Differentiation, B-Lymphocyte--Chemistry--CH; Base Sequence; Chromosome

-more-

?

Display 5/9,KWIC/1 (Item 1 from file: 154)
DIALOG(R)File 154:MEDLINE(R)

Mapping; Chromosomes, *Human*, Pair 1; Cloning, Molecular; DNA, Complementary--Genetics--GE; Gene Expression; Genes, Structural; Lymphocyte Transformation; Membrane Glycoproteins--Genetics--GE; Molecular Sequence Data; RNA, Messenger--Genetics--GE; Sequence Alignment; Sequence Homology, Amino Acid

Molecular Sequence Databank No.: GENBANK/X75962

CAS Registry No.: 0 (Antigens, CD); 0 (Antigens, CD27); 0 (Antigens, CD40); 0 (Antigens, Differentiation, B-Lymphocyte); 0 (DNA, Complementary); 0 (Membrane Glycoproteins); 0 (OX40 protein); 0 (RNA, Messenger)

Gene Symbol: CD40; ACT35; CD40; *4-1BB*

The *human* OX40 homolog: cDNA structure, expression and chromosomal assignment of the ACT35 antigen.

Tissue distribution and expression on mitogen and virally stimulated lymphocytes render the ACT35 molecule a *human* lymphocyte activation antigen which as yet could not be clustered. Expression cloning of the

-more-

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Display 5/9,KWIC/1 (Item 1 from file: 154)
DIALOG(R)File 154:MEDLINE(R)

ACT35...

...277-amino acid sequence of the single transmembrane protein were 65% and 63% identical, in *human* and in rat, respectively. Conservation included one N-linked glycosylation site and one protein kinase...

... molecule (relative molecular mass 48,000). Thus, the ACT35 protein corresponds to the hitherto unknown *human* OX40 antigen and is, therefore, another member of the tumor necrosis factor/nerve growth factor *receptor* (TNFR/NGFR) family. After applying fluorescence in situ hybridization, the *human* ACT35/OX40 gene could be mapped to chromosome band 1p36 and is, thus, linked to...

- end of record -

?

Display 5/9,KWIC/1 (Item 1 from file: 154)
DIALOG(R)File 154:MEDLINE(R)
(c) format only 1996 Knight-Ridder Info. All rts. reserv.
...Tags: *Human*;
...; Antigens, CD--Chemistry--CH; Antigens, Differentiation, B-Lymphocyte --Chemistry--CH; Base Sequence; Chromosome Mapping; Chromosomes, *Human*, Pair 1; Cloning, Molecular; DNA, Complementary--Genetics--GE; Gene Expression; Genes, Structural; Lymphocyte Transformation; Membrane...

- end of record -

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Display 5/9,KWIC/1 (Item 1 from file: 154)
DIALOG(R)File 154:MEDLINE(R)
(c) format only 1996 Knight-Ridder Info. All rts. reserv.
Gene Symbol: CD40; ACT35; CD40; *4-1BB*

- end of record -

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Display 5/9,KWIC/2 (Item 2 from file: 154)
DIALOG(R)File 154:MEDLINE(R)
(c) format only 1996 Knight-Ridder Info. All rts. reserv.

08694225 94009225
Molecular cloning of a ligand for the inducible T cell gene 4-1BB: a member of an emerging family of cytokines with homology to tumor necrosis factor.
Goodwin RG; Din WS; Davis-Smith T; Anderson DM; Gimpel SD; Sato TA; Maliszewski CR; Brannan CI; Copeland NG; Jenkins NA; et al
Immunex Research and Development Corporation, Seattle, WA 98101.
Eur J Immunol (GERMANY) Oct 1993, 23 (10) p2631-41, ISSN 0014-2980 Journal Code: EN5
Contract/Grant No.: N01-CO-74101, CO, NCI
Languages: ENGLISH
Document type: JOURNAL ARTICLE
JOURNAL ANNOUNCEMENT: 9401
Subfile: INDEX MEDICUS
4-1BB is an inducible T cell antigen that shows sequence homology to members of an emerging family of cytokine receptors, including those for

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Display 5/9,KWIC/2 (Item 2 from file: 154)
DIALOG(R)File 154:MEDLINE(R)
(c) format only 1996 Knight-Ridder Info. All rts. reserv.
tumor necrosis factor and nerve growth factor. To aid in the analysis of the function of 4-1BB we have utilized a soluble form of the molecule as a probe to identify and clone the gene which encodes its ligand. The ligand for 4-1BB is a type II membrane glycoprotein that has homology to tumor necrosis factor, lymphotoxin, and the ligands for CD40 and CD27, all of which are themselves ligands to receptors in this superfamily. The gene for 4-1BB is on mouse chromosome 4 and maps close to the p80 form of the tumor

necrosis factor *receptor* as well as the gene for CD30. The gene for 4-1BB ligand maps to mouse chromosome 17, but considerably distal to the tumor necrosis factor and lymphotoxin genes. Interaction of 4-1BB with its ligand induces the proliferation of activated thymocytes and splenic T cells, a response which is mimicked on similar cell populations stimulated with an antibody to 4-1BB.
Tags: Animal; Female; *Human*; Male; Support, U.S. Gov't, P.H.S
Descriptors: *Cytokines--Genetics--GE; *Membrane Glycoproteins --Metabolism--ME; *T-Lymphocytes--Immunology--IM; *Tumor Necrosis Factor --Genetics--GE; Amino Acid Sequence; Base Sequence; Chromosome Mapping;

-more-

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Display 5/9,KWIC/2 (Item 2 from file: 154)
DIALOG(R)File 154:MEDLINE(R)

Cloning, Molecular; Cytokines--Immunology--IM; DNA, Complementary--Genetics --GE; Ligands; Lymphocyte Transformation; Membrane Glycoproteins--Chemistry --CH; Membrane Glycoproteins--Genetics--GE; Mice; Mice, Inbred C57BL; Molecular Sequence Data; Muridae; Recombinant Fusion Proteins--Genetics--GE ; Sequence Homology, Amino Acid
Molecular Sequence Databank No.: GENBANK/L15435; GENBANK/Z25442; GENBANK/Z25443; GENBANK/Z25444; GENBANK/Z25445; GENBANK/Z25446; GENBANK/Z25447; GENBANK/Z25448; GENBANK/Z25449; GENBANK/Z25450
CAS Registry No.: 0 (Cytokines); 0 (DNA, Complementary); 0 (Ligands) ; 0 (Membrane Glycoproteins); 0 (Recombinant Fusion Proteins); 0 (Tumor Necrosis Factor); 0 (4-1BB ligand)
Gene Symbol: *4-1BB*

... mouse chromosome 4 and maps close to the p80 form of the tumor necrosis factor *receptor* as well as the gene for CD30. The gene for 4-1BB ligand maps to...

- end of record -

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Display 5/9,KWIC/2 (Item 2 from file: 154)
DIALOG(R)File 154:MEDLINE(R)

...Tags: *Human*;
Gene Symbol: *4-1BB*

- end of record -

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Display 5/9,KWIC/3 (Item 3 from file: 154)
DIALOG(R)File 154:MEDLINE(R)

08499296 93209296
Cloning and expression of murine CD27: comparison with 4-1BB, another lymphocyte-specific member of the nerve growth factor *receptor* family.
Gravestein LA; Blom B; Nolten LA; de Vries E; van der Horst G; Ossendorp F; Borst J; Loenen WA
Division of Immunology, The Netherlands Cancer Institute, Amsterdam.
Eur J Immunol (GERMANY) Apr 1993, 23 (4) p943-50, ISSN 0014-2980
Journal Code: EN5

Languages: ENGLISH
Document type: JOURNAL ARTICLE
JOURNAL ANNOUNCEMENT: 9307
Subfile: INDEX MEDICUS
CD27 is a member of the nerve growth factor *receptor* family, that includes two types of tumor necrosis factor *receptor*, CD40 and Fas/Apo-1. *Human* CD27 has been found only on lymphocytes. In T cells, its expression strongly increases in a transient fashion upon antigenic stimulation,

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Display 5/9,KWIC/3 (Item 3 from file: 154)
DIALOG(R)File 154:MEDLINE(R)

suggesting that CD27 plays a role during T cell activation. To analyze the function of CD27, we have identified the murine CD27 at the cDNA and protein level. Murine CD27 shows an identity of 65% compared with *human* CD27. The amino-terminal cysteine-rich region, i.e. the putative ligand-binding domain, and the carboxy-terminal part of the cytoplasmic domain are approximately 80% identical in man and mouse. Murine CD27 has 29% identity to 4-1BB, another lymphocyte-specific member of the *receptor* family defined only at the cDNA level. Murine CD27 and 4-1BB have 39% homology in the cysteine-rich domain and share a conserved region in the cytoplasmic tail. Expression studies identified murine CD27 mRNA in thymus and spleen, but not in non-lymphoid tissues, while 4-1BB mRNA was not detected in any tissue tested. In resting T cells, only murine CD27 mRNA was found, while in activated T cells murine CD27 as well as 4-1BB were present at high levels. Murine CD27 and 4-1BB mRNA are expressed with different kinetics during T cell activation, suggesting that these molecules play different roles in this process. Peptide antisera identified murine CD27 as a 45-kDa protein on thymocytes and activated T cells, while

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Display 5/9,KWIC/3 (Item 3 from file: 154)
DIALOG(R)File 154:MEDLINE(R)

4-1BB was precipitated as a 35-40-kDa protein from activated T cells.
Tags: Animal; Comparative Study; *Human*; Support, Non-U.S. Gov't
Descriptors: *Antigens, CD--Genetics--GE; *Antigens, Differentiation, T-Lymphocyte--Genetics--GE; *Receptors, Cell Surface--Genetics--GE; *T-Lymphocytes--Physiology--PH; Amino Acid Sequence; Antigens, CD --Metabolism--ME; Antigens, Differentiation, T-Lymphocyte--Metabolism--ME; Base Sequence; Cloning, Molecular; DNA--Genetics--GE; Gene Expression; Genes, Reiterated; Lymphocyte Transformation; Membrane Glycoproteins --Genetics--GE; Mice; Molecular Sequence Data; Receptors, Nerve Growth Factor--Genetics--GE; RNA, Messenger--Genetics--GE; Sequence Alignment; Tissue Distribution
Molecular Sequence Databank No.: GENBANK/L24495; GENBANK/Z18316; GENBANK/Z18317; GENBANK/Z18318; GENBANK/Z18319; GENBANK/X66042; GENBANK/X66043; GENBANK/X66045; GENBANK/X66046; GENBANK/X67167
CAS Registry No.: 0 (Antigens, CD); 0 (Antigens, CD27); 0 (Antigens, Differentiation, T-Lymphocyte); 0 (Membrane Glycoproteins); 0 (Receptors, Cell Surface); 0 (Receptors, Nerve Growth Factor); 0 (RNA,

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Display 5/9,KWIC/3 (Item 3 from file: 154)
DIALOG(R)File 154:MEDLINE(R)
(c) format only 1996 Knight-Ridder Info. All rts. reserv.
Messenger); 0 (4-1BB receptor); 9007-49-2 (DNA)
Gene Symbol: CD27; *4-1BB*

...murine CD27: comparison with 4-1BB, another lymphocyte-specific member of the nerve growth factor *receptor* family.
CD27 is a member of the nerve growth factor *receptor* family, that includes two types of tumor necrosis factor *receptor*, CD40 and Fas/Apo-1. *Human* CD27 has been found only on lymphocytes. In T cells, its expression strongly increases in...

... at the cDNA and protein level. Murine CD27 shows an identity of 65% compared with *human* CD27. The amino-terminal cysteine-rich region, i.e. the putative ligand-binding domain, and...

... mouse. Murine CD27 has 29% identity to 4-1BB, another lymphocyte-specific member of the *receptor* family defined only at the cDNA level. Murine CD27 and 4-1BB have 39% homology...

- end of record -
?

Display 5/9,KWIC/3 (Item 3 from file: 154)
DIALOG(R)File 154:MEDLINE(R)
(c) format only 1996 Knight-Ridder Info. All rts. reserv.
...Tags: *Human*;
Gene Symbol: CD27; *4-1BB*
...Chemical Name: T-Lymphocyte; (Membrane Glycoproteins; (Receptors, Cell Surface; (Receptors, Nerve Growth Factor; (RNA, Messenger; (4-1BB *receptor*; (DNA

- end of record -
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Display 5/9,KWIC/4 (Item 1 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 1996 Knight-Ridder Info. All rts. reserv.

08855844 94170844
The *human* OX40 homolog: cDNA structure, expression and chromosomal assignment of the ACT35 antigen.
Latza U; Durkop H; Schnittger S; Ringeling J; Eitelbach F; Hummel M; Fonatsch C; Stein H
Institute of Pathology, Free University of Berlin, FRG.
Eur J Immunol (GERMANY) Mar 1994, 24 (3) p677-83, ISSN 0014-2980
Journal Code: EN5
Languages: ENGLISH
Document type: JOURNAL ARTICLE
JOURNAL ANNOUNCEMENT: 9406
Subfile: INDEX MEDICUS
Tissue distribution and expression on mitogen and virally stimulated lymphocytes render the ACT35 molecule a *human* lymphocyte activation antigen which as yet could not be clustered. Expression cloning of the ACT35 antigen from a pCDM8 library of the HUT-102 cell line revealed strong

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Display 5/9,KWIC/4 (Item 1 from file: 155)
DIALOG(R)File 155:MEDLINE(R)

homology of the cDNA and its encoded protein sequence with the formerly described rat OX40 antigen. The 1.4-kb nucleotide sequence and the deduced 277-amino acid sequence of the single transmembrane protein were 65% and 63% identical, in *human* and in rat, respectively. Conservation included one N-linked glycosylation site and one protein kinase C phosphorylation site. When expressed in COS-1 cells, the cDNA presented properties comparable to the native ACT35 antigen and the rat OX40 molecule (relative molecular mass 48,000). Thus, the ACT35 protein corresponds to the hitherto unknown *human* OX40 antigen and is, therefore, another member of the tumor necrosis factor/nerve growth factor *receptor* (TNFR/NGFR) family. After applying fluorescence in situ hybridization, the *human* ACT35/OX40 gene could be mapped to chromosome band 1p36 and is, thus, linked to the genes for TNFR II and CD30.
Tags: Comparative Study; *Human*; Support, Non-U.S. Gov't
Descriptors: *Antigens, CD--Genetics--GE; *Antigens, CD27--Genetics--GE; Amino Acid Sequence; Antigens, CD--Chemistry--CH; Antigens, Differentiation, B-Lymphocyte--Chemistry--CH; Base Sequence; Chromosome

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Display 5/9,KWIC/4 (Item 1 from file: 155)
DIALOG(R)File 155:MEDLINE(R)

Mapping; Chromosomes, *Human*, Pair 1; Cloning, Molecular; DNA, Complementary--Genetics--GE; Gene Expression; Genes, Structural; Lymphocyte Transformation; Membrane Glycoproteins--Genetics--GE; Molecular Sequence Data; RNA, Messenger--Genetics--GE; Sequence Alignment; Sequence Homology, Amino Acid
Molecular Sequence Databank No.: GENBANK/X75962
CAS Registry No.: 0 (Antigens, CD); 0 (Antigens, CD27); 0 (Antigens, CD40); 0 (Antigens, Differentiation, B-Lymphocyte); 0 (DNA, Complementary); 0 (Membrane Glycoproteins); 0 (OX40 protein); 0 (RNA, Messenger)
Gene Symbol: CD40; ACT35; CD40; *4-1BB*

The *human* OX40 homolog: cDNA structure, expression and chromosomal assignment of the ACT35 antigen.
Tissue distribution and expression on mitogen and virally stimulated lymphocytes render the ACT35 molecule a *human* lymphocyte activation antigen which as yet could not be clustered. Expression cloning of the

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Display 5/9,KWIC/4 (Item 1 from file: 155)
DIALOG(R)File 155:MEDLINE(R)

ACT35...

...277-amino acid sequence of the single transmembrane protein were 65% and

63% identical, in *human* and in rat, respectively. Conservation included one N-linked glycosylation site and one protein kinase...

... molecule (relative molecular mass 48,000). Thus, the ACT35 protein corresponds to the hitherto unknown *human* OX40 antigen and is, therefore, another member of the tumor necrosis factor/nerve growth factor *receptor* (TNFR/NGFR) family. After applying fluorescence in situ hybridization, the *human* ACT35/OX40 gene could be mapped to chromosome band 1p36 and is, thus, linked to...

- end of record -

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Display 5/9,KWIC/4 (Item 1 from file: 155)
DIALOG(R)File 155:MEDLINE(R)

...Tags: *Human*;
...; Antigens, CD--Chemistry--CH; Antigens, Differentiation, B-Lymphocyte --Chemistry--CH; Base Sequence; Chromosome Mapping; Chromosomes, *Human*, Pair 1; Cloning, Molecular; DNA, Complementary--Genetics--GE; Gene Expression; Genes, Structural; Lymphocyte Transformation; Membrane...

- end of record -

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Display 5/9,KWIC/4 (Item 1 from file: 155)
DIALOG(R)File 155:MEDLINE(R)

Gene Symbol: CD40; ACT35; CD40; *4-1BB*

- end of record -

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Display 5/9,KWIC/5 (Item 2 from file: 155)
DIALOG(R)File 155:MEDLINE(R)

08694225 94009225
Molecular cloning of a ligand for the inducible T cell gene 4-1BB: a member of an emerging family of cytokines with homology to tumor necrosis factor.
Goodwin RG; Din WS; Davis-Smith T; Anderson DM; Gimpel SD; Sato TA; Maliszewski CR; Brannan CI; Copeland NG; Jenkins NA; et al
Immunex Research and Development Corporation, Seattle, WA 98101.
Eur J Immunol (GERMANY) Oct 1993, 23 (10) p2631-41, ISSN 0014-2980 Journal Code: EN5
Contract/Grant No.: N01-CO-74101, CO, NCI
Languages: ENGLISH
Document type: JOURNAL ARTICLE
JOURNAL ANNOUNCEMENT: 9401
Subfile: INDEX MEDICUS
4-1BB is an inducible T cell antigen that shows sequence homology to members of an emerging family of cytokine receptors, including those for

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Display 5/9,KWIC/5 (Item 2 from file: 155)

DIALOG(R)File 155:MEDLINE(R)

tumor necrosis factor and nerve growth factor. To aid in the analysis of the function of 4-1BB we have utilized a soluble form of the molecule as a probe to identify and clone the gene which encodes its ligand. The ligand for 4-1BB is a type II membrane glycoprotein that has homology to tumor necrosis factor, lymphotoxin, and the ligands for CD40 and CD27, all of which are themselves ligands to receptors in this superfamily. The gene for 4-1BB is on mouse chromosome 4 and maps close to the p80 form of the tumor necrosis factor *receptor* as well as the gene for CD30. The gene for 4-1BB ligand maps to mouse chromosome 17, but considerably distal to the tumor necrosis factor and lymphotoxin genes. Interaction of 4-1BB with its ligand induces the proliferation of activated thymocytes and splenic T cells, a response which is mimicked on similar cell populations stimulated with an antibody to 4-1BB.
Tags: Animal; Female; *Human*; Male; Support, U.S. Gov't, P.H.S
Descriptors: *Cytokines--Genetics--GE; *Membrane Glycoproteins --Metabolism--ME; *T-Lymphocytes--Immunology--IM; *Tumor Necrosis Factor --Genetics--GE; Amino Acid Sequence; Base Sequence; Chromosome Mapping;

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Display 5/9,KWIC/5 (Item 2 from file: 155)
DIALOG(R)File 155:MEDLINE(R)

Cloning, Molecular; Cytokines--Immunology--IM; DNA, Complementary--Genetics --GE; Ligands; Lymphocyte Transformation; Membrane Glycoproteins--Chemistry --CH; Membrane Glycoproteins--Genetics--GE; Mice; Mice, Inbred C57BL; Molecular Sequence Data; Muridae; Recombinant Fusion Proteins--Genetics--GE ; Sequence Homology, Amino Acid
Molecular Sequence Databank No.: GENBANK/L15435; GENBANK/Z25442; GENBANK/Z25443; GENBANK/Z25444; GENBANK/Z25445; GENBANK/Z25446; GENBANK/Z25447; GENBANK/Z25448; GENBANK/Z25449; GENBANK/Z25450
CAS Registry No.: 0 (Cytokines); 0 (DNA, Complementary); 0 (Ligands) ; 0 (Membrane Glycoproteins); 0 (Recombinant Fusion Proteins); 0 (Tumor Necrosis Factor); 0 (4-1BB ligand)
Gene Symbol: *4-1BB*

... mouse chromosome 4 and maps close to the p80 form of the tumor necrosis factor *receptor* as well as the gene for CD30. The gene for 4-1BB ligand maps to...

- end of record -
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Display 5/9,KWIC/5 (Item 2 from file: 155)
DIALOG(R)File 155:MEDLINE(R)

...Tags: *Human*;
Gene Symbol: *4-1BB*

- end of record -
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Display 5/9,KWIC/6 (Item 3 from file: 155)
DIALOG(R)File 155:MEDLINE(R)

08499296 93209296
Cloning and expression of murine CD27: comparison with 4-1BB, another lymphocyte-specific member of the nerve growth factor *receptor* family.
Gravestein LA; Blom B; Nolten LA; de Vries E; van der Horst G; Ossendorp F; Borst J; Loenen WA
Division of Immunology, The Netherlands Cancer Institute, Amsterdam.
Eur J Immunol (GERMANY) Apr 1993, 23 (4) p943-50, ISSN 0014-2980
Journal Code: EN5
Languages: ENGLISH
Document type: JOURNAL ARTICLE
JOURNAL ANNOUNCEMENT: 9307
Subfile: INDEX MEDICUS
CD27 is a member of the nerve growth factor *receptor* family, that includes two types of tumor necrosis factor *receptor*, CD40 and Fas/Apo-1. *Human* CD27 has been found only on lymphocytes. In T cells, its expression strongly increases in a transient fashion upon antigenic stimulation,

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Display 5/9,KWIC/6 (Item 3 from file: 155)
DIALOG(R)File 155:MEDLINE(R)

suggesting that CD27 plays a role during T cell activation. To analyze the function of CD27, we have identified the murine CD27 at the cDNA and protein level. Murine CD27 shows an identity of 65% compared with *human* CD27. The amino-terminal cysteine-rich region, i.e. the putative ligand-binding domain, and the carboxy-terminal part of the cytoplasmic domain are approximately 80% identical in man and mouse. Murine CD27 has 29% identity to 4-1BB, another lymphocyte-specific member of the *receptor* family defined only at the cDNA level. Murine CD27 and 4-1BB have 39% homology in the cysteine-rich domain and share a conserved region in the cytoplasmic tail. Expression studies identified murine CD27 mRNA in thymus and spleen, but not in non-lymphoid tissues, while 4-1BB mRNA was not detected in any tissue tested. In resting T cells, only murine CD27 mRNA was found, while in activated T cells murine CD27 as well as 4-1BB were present at high levels. Murine CD27 and 4-1BB mRNA are expressed with different kinetics during T cell activation, suggesting that these molecules play different roles in this process. Peptide antisera identified murine CD27 as a 45-kDa protein on thymocytes and activated T cells, while

-more-

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Display 5/9,KWIC/6 (Item 3 from file: 155)
DIALOG(R)File 155:MEDLINE(R)

4-1BB was precipitated as a 35-40-kDa protein from activated T cells.
Tags: Animal; Comparative Study; *Human*; Support, Non-U.S. Gov't
Descriptors: *Antigens, CD--Genetics--GE; *Antigens, Differentiation, T-Lymphocyte--Genetics--GE; *Receptors, Cell Surface--Genetics--GE; *T-Lymphocytes--Physiology--PH; Amino Acid Sequence; Antigens, CD --Metabolism--ME; Antigens, Differentiation, T-Lymphocyte--Metabolism--ME; Base Sequence; Cloning, Molecular; DNA--Genetics--GE; Gene Expression; Genes, Reiterated; Lymphocyte Transformation; Membrane Glycoproteins --Genetics--GE; Mice; Molecular Sequence Data; Receptors, Nerve Growth Factor--Genetics--GE; RNA, Messenger--Genetics--GE; Sequence Alignment;

Tissue Distribution
Molecular Sequence Databank No.: GENBANK/L24495; GENBANK/Z18316; GENBANK/Z18317; GENBANK/Z18318; GENBANK/Z18319; GENBANK/X66042; GENBANK/X66043; GENBANK/X66045; GENBANK/X66046; GENBANK/X67167
CAS Registry No.: 0 (Antigens, CD); 0 (Antigens, CD27); 0 (Antigens, Differentiation, T-Lymphocyte); 0 (Membrane Glycoproteins); 0 (Receptors, Cell Surface); 0 (Receptors, Nerve Growth Factor); 0 (RNA,

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Display 5/9,KWIC/6 (Item 3 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 1996 Knight-Ridder Info. All rts. reserv.
Messenger); 0 (4-1BB receptor); 9007-49-2 (DNA)
Gene Symbol: CD27; *4-1BB*

...murine CD27: comparison with 4-1BB, another lymphocyte-specific member of the nerve growth factor *receptor* family.
CD27 is a member of the nerve growth factor *receptor* family, that includes two types of tumor necrosis factor *receptor*, CD40 and Fas/Apo-1. *Human* CD27 has been found only on lymphocytes. In T cells, its expression strongly increases in...

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... mouse. Murine CD27 has 29% identity to 4-1BB, another lymphocyte-specific member of the *receptor* family defined only at the cDNA level. Murine CD27 and 4-1BB have 39% homology...

- end of record -

?

Display 5/9,KWIC/6 (Item 3 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 1996 Knight-Ridder Info. All rts. reserv.
...Tags: *Human*;
Gene Symbol: CD27; *4-1BB*
...Chemical Name: T-Lymphocyte; (Membrane Glycoproteins; (Receptors, Cell Surface; (Receptors, Nerve Growth Factor; (RNA, Messenger; (4-1BB *receptor*; (DNA

- end of record -

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Display 5/9,KWIC/7 (Item 1 from file: 159)
DIALOG(R)File 159:Cancerlit(R)
(c) format only 1996 Knight-Ridder Info. All rts. reserv.

01081792 94170844 MEDL/94170844
The *human* OX40 homolog: cDNA structure, expression and chromosomal assignment of the ACT35 antigen.
Latza U; Durkop H; Schnittger S; Ringeling J; Eitelbach F; Hummel M; Fonatsch C; Stein H
Institute of Pathology, Free University of Berlin, FRG.
Eur J Immunol; 24(3):677-83 1994 ISSN 0014-2980 Journal Code: EN5

Languages: ENGLISH
Document Type: JOURNAL ARTICLE
Journal Announcement: 9405
Subfile: X; L; M
Tissue distribution and expression on mitogen and virally stimulated lymphocytes render the ACT35 molecule a *human* lymphocyte activation antigen which as yet could not be clustered. Expression cloning of the ACT35 antigen from a pCDM8 library of the HUT-102 cell line revealed strong homology of the cDNA and its encoded protein sequence with the formerly

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Display 5/9,KWIC/7 (Item 1 from file: 159)
DIALOG(R)File 159:Cancerlit(R)
(c) format only 1996 Knight-Ridder Info. All rts. reserv.
described rat OX40 antigen. The 1.4-kb nucleotide sequence and the deduced 277-amino acid sequence of the single transmembrane protein were 65% and 63% identical, in *human* and in rat, respectively. Conservation included one N-linked glycosylation site and one protein kinase C phosphorylation site. When expressed in COS-1 cells, the cDNA presented properties comparable to the native ACT35 antigen and the rat OX40 molecule (relative molecular mass 48,000). Thus, the ACT35 protein corresponds to the hitherto unknown *human* OX40 antigen and is, therefore, another member of the tumor necrosis factor/nerve growth factor *receptor* (TNFR/NGFR) family. After applying fluorescence in situ hybridization, the *human* ACT35/OX40 gene could be mapped to chromosome band 1p36 and is, thus, linked to the genes for TNFR II and CD30.
Tags: Comparative Study; *Human*; Support, Non-U.S. Gov't
Major Descriptors: *Antigens, CD--Genetics--GE; *Antigens, CD27--Genetics --GE
Minor Descriptors: Amino Acid Sequence; Antigens, CD--Chemistry--CH; Antigens, Differentiation, B-Lymphocyte--Chemistry--CH; Base Sequence;

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Display 5/9,KWIC/7 (Item 1 from file: 159)
DIALOG(R)File 159:Cancerlit(R)
(c) format only 1996 Knight-Ridder Info. All rts. reserv.
Chromosome Mapping; Chromosomes, *Human*, Pair 1; Cloning, Molecular; DNA, Complementary--Genetics--GE; Gene Expression; Genes, Structural; Lymphocyte Transformation; Membrane Glycoproteins--Genetics--GE; Molecular Sequence Data; RNA, Messenger--Genetics--GE; Sequence Alignment; Sequence Homology, Amino Acid
CAS Registry No.: 0 (Antigens, CD); 0 (Antigens, CD27); 0 (Antigens, Differentiation, B-Lymphocyte); 0 (CD40 antigen); 0 (DNA, Complementary) ; 0 (Membrane Glycoproteins); 0 (OX40 protein); 0 (RNA, Messenger)
Gene Symbol: CD40; ACT35; CD40; *4-1BB*

The *human* OX40 homolog: cDNA structure, expression and chromosomal assignment of the ACT35 antigen.
Tissue distribution and expression on mitogen and virally stimulated lymphocytes render the ACT35 molecule a *human* lymphocyte activation antigen which as yet could not be clustered. Expression cloning of the ACT35...

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Display 5/9,KWIC/7 (Item 1 from file: 159)
DIALOG(R)File 159:Cancerlit(R)
(c) format only 1996 Knight-Ridder Info. All rts. reserv.
...277-amino acid sequence of the single transmembrane protein were 65% and 63% identical, in *human* and in rat, respectively. Conservation included one N-linked glycosylation site and one protein kinase...

... molecule (relative molecular mass 48,000). Thus, the ACT35 protein corresponds to the hitherto unknown *human* OX40 antigen and is, therefore, another member of the tumor necrosis factor/nerve growth factor *receptor* (TNFR/NGFR) family. After applying fluorescence in situ hybridization, the *human* ACT35/OX40 gene could be mapped to chromosome band 1p36 and is, thus, linked to...

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Display 5/9,KWIC/7 (Item 1 from file: 159)
DIALOG(R)File 159:Cancerlit(R)
(c) format only 1996 Knight-Ridder Info. All rts. reserv.
...Tags: *Human*;
...Minor Descriptors: Antigens, CD--Chemistry--CH; Antigens, Differentiation, B-Lymphocyte--Chemistry--CH; Base Sequence; Chromosome Mapping; Chromosomes, *Human*, Pair 1; Cloning, Molecular; DNA, Complementary--Genetics--GE; Gene Expression; Genes, Structural; Lymphocyte Transformation; Membrane...

- end of record -

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Display 5/9,KWIC/7 (Item 1 from file: 159)
DIALOG(R)File 159:Cancerlit(R)
(c) format only 1996 Knight-Ridder Info. All rts. reserv.
Gene Symbol: CD40; ACT35; CD40; *4-1BB*

- end of record -

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Display 5/9,KWIC/8 (Item 2 from file: 159)
DIALOG(R)File 159:Cancerlit(R)
(c) format only 1996 Knight-Ridder Info. All rts. reserv.

01041647 94009225 MEDL/94009225
Molecular cloning of a ligand for the inducible T cell gene 4-1BB: a member of an emerging family of cytokines with homology to tumor necrosis factor.
Goodwin RG; Din WS; Davis-Smith T; Anderson DM; Gimpel SD; Sato TA; Maliszewski CR; Brannan CI; Copeland NG; Jenkins NA; et al
Immunex Research and Development Corporation, Seattle, WA 98101.
Eur J Immunol; 23(10):2631-41 1993 ISSN 0014-2980 Journal Code: EN5
Contract/Grant No.: N01-CO-74101, CO, NCI
Languages: ENGLISH
Document Type: JOURNAL ARTICLE
Journal Announcement: 9312
Subfile: X; L; M
4-1BB is an inducible T cell antigen that shows sequence homology to

members of an emerging family of cytokine receptors, including those for tumor necrosis factor and nerve growth factor. To aid in the analysis of

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Display 5/9,KWIC/8 (Item 2 from file: 159)
DIALOG(R)File 159:Cancerlit(R)
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the function of 4-1BB we have utilized a soluble form of the molecule as a probe to identify and clone the gene which encodes its ligand. The ligand for 4-1BB is a type II membrane glycoprotein that has homology to tumor necrosis factor, lymphotoxin, and the ligands for CD40 and CD27, all of which are themselves ligands to receptors in this superfamily. The gene for 4-1BB is on mouse chromosome 4 and maps close to the p80 form of the tumor necrosis factor *receptor* as well as the gene for CD30. The gene for 4-1BB ligand maps to mouse chromosome 17, but considerably distal to the tumor necrosis factor and lymphotoxin genes. Interaction of 4-1BB with its ligand induces the proliferation of activated thymocytes and splenic T cells, a response which is mimicked on similar cell populations stimulated with an antibody to 4-1BB.
Tags: Animal; Female; *Human*; Male; Support, U.S. Gov't, P.H.S
Major Descriptors: *Cytokines--Genetics--GE; *T-Lymphocytes--Immunology --IM; *Tumor Necrosis Factor--Genetics--GE
Minor Descriptors: Amino Acid Sequence; Base Sequence; Chromosome Mapping ; Cloning, Molecular; Cytokines--Immunology--IM; DNA, Complementary

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Display 5/9,KWIC/8 (Item 2 from file: 159)
DIALOG(R)File 159:Cancerlit(R)
(c) format only 1996 Knight-Ridder Info. All rts. reserv.
--Genetics--GE; Ligands; Lymphocyte Transformation; Mice; Mice, Inbred C57BL; Molecular Sequence Data; Muridae; Recombinant Fusion Proteins --Genetics--GE; Sequence Homology, Amino Acid
CAS Registry No.: 0 (Cytokines); 0 (DNA, Complementary); 0 (Ligands) ; 0 (Recombinant Fusion Proteins); 0 (Tumor Necrosis Factor)
Gene Symbol: *4-1BB*

... mouse chromosome 4 and maps close to the p80 form of the tumor necrosis factor *receptor* as well as the gene for CD30. The gene for 4-1BB ligand maps to...

- end of record -

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Display 5/9,KWIC/8 (Item 2 from file: 159)
DIALOG(R)File 159:Cancerlit(R)
(c) format only 1996 Knight-Ridder Info. All rts. reserv.
...Tags: *Human*;
Gene Symbol: *4-1BB*

- end of record -

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Display 5/9,KWIC/9 (Item 3 from file: 159)
DIALOG(R)File 159:Cancerlit(R)

01005432 93209296 MEDL/93209296
Cloning and expression of murine CD27: comparison with 4-1BB, another lymphocyte-specific member of the nerve growth factor *receptor* family.
Gravestein LA; Blom B; Nolten LA; de Vries E; van der Horst G; Ossendorp F; Borst J; Loenen WA
Division of Immunology, The Netherlands Cancer Institute, Amsterdam.
Eur J Immunol; 23(4):943-50 1993 ISSN 0014-2980 Journal Code: EN5
Languages: ENGLISH
Document Type: JOURNAL ARTICLE
Journal Announcement: 9306
Subfile: X; L; M
CD27 is a member of the nerve growth factor *receptor* family, that includes two types of tumor necrosis factor *receptor*, CD40 and Fas/Apo-1. *Human* CD27 has been found only on lymphocytes. In T cells, its expression strongly increases in a transient fashion upon antigenic stimulation, suggesting that CD27 plays a role during T cell activation. To analyze the

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Display 5/9,KWIC/9 (Item 3 from file: 159)
DIALOG(R)File 159:Cancerlit(R)

function of CD27, we have identified the murine CD27 at the cDNA and protein level. Murine CD27 shows an identity of 65% compared with *human* CD27. The amino-terminal cysteine-rich region, i.e. the putative ligand-binding domain, and the carboxy-terminal part of the cytoplasmic domain are approximately 80% identical in man and mouse. Murine CD27 has 29% identity to 4-1BB, another lymphocyte-specific member of the *receptor* family defined only at the cDNA level. Murine CD27 and 4-1BB have 39% homology in the cysteine-rich domain and share a conserved region in the cytoplasmic tail. Expression studies identified murine CD27 mRNA in thymus and spleen, but not in non-lymphoid tissues, while 4-1BB mRNA was not detected in any tissue tested. In resting T cells, only murine CD27 mRNA was found, while in activated T cells murine CD27 as well as 4-1BB were present at high levels. Murine CD27 and 4-1BB mRNA are expressed with different kinetics during T cell activation, suggesting that these molecules play different roles in this process. Peptide antisera identified murine CD27 as a 45-kDa protein on thymocytes and activated T cells, while 4-1BB was precipitated as a 35-40-kDa protein from activated T cells.

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Display 5/9,KWIC/9 (Item 3 from file: 159)
DIALOG(R)File 159:Cancerlit(R)
(c) format only 1996 Knight-Ridder Info. All rts. reserv.
Tags: Animal; Comparative Study; *Human*; Support, Non-U.S. Gov't
Major Descriptors: *Antigens, CD--Genetics--GE; *Antigens, Differentiation, T-Lymphocyte--Genetics--GE; *Receptors, Cell Surface --Genetics--GE; *T-Lymphocytes--Physiology--PH
Minor Descriptors: Amino Acid Sequence; Antigens, CD--Metabolism--ME; Antigens, Differentiation, T-Lymphocyte--Metabolism--ME; Base Sequence; Cloning, Molecular; DNA--Genetics--GE; Gene Expression; Genes, Reiterated; Lymphocyte Transformation; Membrane Glycoproteins--Genetics--GE; Mice; Molecular Sequence Data; RNA, Messenger--Genetics--GE; Receptors, Nerve

Growth Factor--Genetics--GE; Sequence Alignment; Tissue Distribution
CAS Registry No.: 0 (Antigens, CD); 0 (Antigens, CD27); 0 (Antigens, Differentiation, T-Lymphocyte); 0 (Membrane Glycoproteins); 0 (Receptors, Cell Surface); 0 (Receptors, Nerve Growth Factor); 0 (RNA, Messenger); 0 (4-1BB receptor); 9007-49-2 (DNA)
Gene Symbol: CD27; *4-1BB*

...murine CD27: comparison with 4-1BB, another lymphocyte-specific member

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Display 5/9,KWIC/9 (Item 3 from file: 159)
DIALOG(R)File 159:Cancerlit(R)
(c) format only 1996 Knight-Ridder Info. All rts. reserv.
of the nerve growth factor *receptor* family.
CD27 is a member of the nerve growth factor *receptor* family, that includes two types of tumor necrosis factor *receptor*, CD40 and Fas/Apo-1. *Human* CD27 has been found only on lymphocytes. In T cells, its expression strongly increases in...

... at the cDNA and protein level. Murine CD27 shows an identity of 65% compared with *human* CD27. The amino-terminal cysteine-rich region, i.e. the putative ligand-binding domain, and...

... mouse. Murine CD27 has 29% identity to 4-1BB, another lymphocyte-specific member of the *receptor* family defined only at the cDNA level. Murine CD27 and 4-1BB have 39% homology...

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Display 5/9,KWIC/9 (Item 3 from file: 159)
DIALOG(R)File 159:Cancerlit(R)
(c) format only 1996 Knight-Ridder Info. All rts. reserv.
...Tags: *Human*;
Gene Symbol: CD27; *4-1BB*
...Chemical Name: T-Lymphocyte; (Membrane Glycoproteins; (Receptors, Cell Surface; (Receptors, Nerve Growth Factor; (RNA, Messenger; (4-1BB *receptor*; (DNA

- end of record -

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Display 5/9,KWIC/10 (Item 1 from file: 440)
DIALOG(R)File 440:Current Contents Search(R)
(c) 1996 Inst for Sci Info. All rts. reserv.

05805164 Genuine Article#: PJ300 Number of References: 47
Title: MOLECULAR AND BIOLOGICAL CHARACTERIZATION OF *HUMAN* 4-1BB AND ITS LIGAND
Author(s): ALDERSON MR; SMITH CA; TOUGH TW; DAVISSMITH T; ARMITAGE RJ; FALK B; ROUX E; BAKER E; SUTHERLAND GR; DIN WS; GOODWIN RG
Corporate Source: IMMUNEX RES & DEV CORP,DEPT CELLULAR IMMUNOL,51UNIV ST/SEATTLE//WA/98101 (Reprint); ADELAIDE CHILDRENS HOSP INC,DEPT CYTOGENET & MOLEC GENET/ADELAIDE/SA/AUSTRALIA/
Journal: EUROPEAN JOURNAL OF IMMUNOLOGY, 1994, V24, N9 (SEP), P2219-2227
ISSN: 0014-2980

Current Contents Journal Announcement: CC LIFE, V37, N43
Language: ENGLISH Document Type: ARTICLE
Geographic Location: USA; AUSTRALIA
Subfile: SciSearch; CC LIFE--Current Contents, Life Sciences
Journal Subject Category: IMMUNOLOGY
Abstract: 4-1BB was originally described as a cDNA expressed by activated

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Display 5/9,KWIC/10 (Item 1 from file: 440)
DIALOG(R)File 440:Current Contents Search(R)
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murine T cells and subsequently demonstrated to encode a member of the tumor necrosis factor *receptor* family of integral membrane proteins. Recently, we identified and cloned a murine ligand for 4-1BB (mu4-1BB-L) and demonstrated it to be a member of an emerging family of ligands with structural homology to tumor necrosis factor. To characterize further the role of 4-1BB in the immune response we undertook to clone the *human* homologue of 4-1BB-L. However, attempts to isolate a cDNA encoding the *human* 4-1BB-L by cross-hybridization with the murine cDNA were unsuccessful. Therefore we first utilized cross-species hybridization to isolate a cDNA encoding *human* 4-1BB (hu4-1BB). A fusion protein consisting of the extracellular portion of hu4-1BB coupled to the Fc region of *human* immunoglobulin G1 (hu4-1BB.Fc) was then used to identify and clone a gene for *human* 4-1BB-L from an activated CD4(+) T cell clone using a direct expression cloning strategy. *Human* 4-1BB-L shows 36% amino acid identity with its murine counterpart and maps to chromosome 19p13.3. Scatchard analysis demonstrated high-affinity binding of hu4-1BB.Fc to either

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Display 5/9,KWIC/10 (Item 1 from file: 440)
DIALOG(R)File 440:Current Contents Search(R)
(c) 1996 Inst for Sci Info. All rts. reserv.
native or recombinant *human* 4-1BB-L. Both monoclonal antibody to hu4-1BB and cells transfected with hu4-1BB-L induced a strong proliferative response in mitogen co-stimulated primary T cells. In contrast, ligation of 4-1BB on T cell clones enhanced activation-induced cell death when triggered by engagement of the TCR/CD3 complex.
Descriptors--Author Keywords: *4-1BB ; *T CELL ACTIVATION ; APOPTOSIS
Identifiers--KeyWords Plus: TUMOR-NECROSIS-FACTOR; GROWTH-FACTOR *RECEPTOR* ; PROGRAMMED CELL-DEATH; CD40 LIGAND; T-CELLS; EMERGING FAMILY; ANTIGEN 4-1BB; NGF *RECEPTOR*; SOLUBLE FORM; FACTOR-ALPHA

Title: MOLECULAR AND BIOLOGICAL CHARACTERIZATION OF *HUMAN* 4-1BB AND ITS LIGAND
...Abstract: murine T cells and subsequently demonstrated to encode a member of the tumor necrosis factor *receptor* family of integral membrane proteins. Recently, we identified and cloned a murine ligand for 4...

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Display 5/9,KWIC/10 (Item 1 from file: 440)
DIALOG(R)File 440:Current Contents Search(R)
(c) 1996 Inst for Sci Info. All rts. reserv.
...further the role of 4-1BB in the immune response we undertook to clone the *human* homologue of 4-1BB-L. However, attempts to isolate a cDNA encoding the *human* 4-1BB-L by cross-hybridization with the murine cDNA were unsuccessful. Therefore we first utilized cross-species hybridization to isolate a cDNA encoding *human* 4-1BB (hu4-1BB). A fusion protein consisting of the extracellular portion of hu4-1BB coupled to the Fc region of *human* immunoglobulin G1 (hu4-1BB.Fc) was then used to identify and clone a gene for *human* 4-1BB-L from an activated CD4(+) T cell clone using a direct expression cloning strategy. *Human* 4-1BB-L shows 36% amino acid identity with its murine counterpart and maps to...

...Scatchard analysis demonstrated high-affinity binding of hu4-1BB.Fc to either native or recombinant *human* 4-1BB-L. Both monoclonal antibody to hu4-1BB and cells transfected with hu4-1BB...

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Display 5/9,KWIC/10 (Item 1 from file: 440)
DIALOG(R)File 440:Current Contents Search(R)
(c) 1996 Inst for Sci Info. All rts. reserv.
...Identifiers--TUMOR-NECROSIS-FACTOR; GROWTH-FACTOR *RECEPTOR*; PROGRAMMED CELL-DEATH; CD40 LIGAND; T-CELLS; EMERGING FAMILY; ANTIGEN 4-1BB; NGF *RECEPTOR*; SOLUBLE FORM; FACTOR-ALPHA

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Display 5/9,KWIC/11 (Item 2 from file: 440)
DIALOG(R)File 440:Current Contents Search(R)
(c) 1996 Inst for Sci Info. All rts. reserv.

05723022 Genuine Article#: PE523 Number of References: 121
Title: A FAMILY OF LIGANDS FOR THE TNF *RECEPTOR* SUPERFAMILY
Author(s): COSMAN D
Corporate Source: IMMUNEX RES & DEV CORP,DEPT MOLEC BIOL,51 UNIV ST/SEATTLE//WA/98101 (Reprint)
Journal: STEM CELLS, 1994, V12, N5 (SEP), P440-455
ISSN: 1066-5099
Current Contents Journal Announcement: CC LIFE, V37, N40
Language: ENGLISH Document Type: REVIEW
Geographic Location: USA
Subfile: SciSearch; CC LIFE--Current Contents, Life Sciences
Journal Subject Category: EXPERIMENTAL BIOLOGY & MEDICINE
Abstract: Recent progress in the definition of molecules involved in immune regulation has led to the discovery of a number of type I membrane glycoproteins with a distinctive, cysteine-rich, repetitive domain structure within their extracellular regions. Because the prototype

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Display 5/9,KWIC/11 (Item 2 from file: 440)
DIALOG(R)File 440:Current Contents Search(R)

(c) 1996 Inst for Sci Info. All rts. reserv.
members of this family are receptors for cytokines (tumor necrosis factor [TNF] and nerve growth factor [NGF]), it was expected that the ligands for the other receptors would possess cytokine-like activities. This prediction has been fulfilled by the cloning of cDNA encoding a series of type II membrane glycoproteins, with homology to TNF, that bind to, and signal through, their cognate receptors. While the biological role of some of these ligand-*receptor* pairs remains obscure, at least two members of the family, CD40 and Fas, have proven their importance. The *human* X-linked immunodeficiency, hyper IgM syndrome, is the result of mutations in the CD40 ligand gene, and the Pas and Pas ligand genes are mutated in two mouse strains, lpr and gld, that develop autoimmune disease. These findings, together with other evidence, point to key roles of CD40/CD40 ligand interactions in immune activation, particularly in T-dependent B cell responses, and of Fas/Fas ligand in apoptosis and peripheral tolerance. These molecules, as well as the other ligands of the family, share the property of costimulation of T cell proliferation and are all expressed by

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Display 5/9,KWIC/11 (Item 2 from file: 440)
DIALOG(R)File 440:Current Contents Search(R)
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activated T cells. More detailed analysis of the expression patterns of ligands and receptors on lymphocyte subpopulations will be necessary to define their different roles in immune activation and suppression.
Descriptors--Author Keywords: CD40 ; CD30 ; CD27 ; FAS ; OX40 ; *4-1BB ; * LYMPHOTOXIN BETA ; HYPER IGM SYNDROME
Identifiers--KeyWords Plus: TUMOR-NECROSIS-FACTOR; T-CELL ACTIVATION; GROWTH-FACTOR *RECEPTOR*; *HUMAN* LYMPHOCYTES-B; X-LINKED IMMUNODEFICIENCY; RECOMBINANT CD40 LIGAND; HYPER-IGM SYNDROME; MOLECULAR-CLONING; FAS ANTIGEN; MONOCLONAL-ANTIBODY

Title: A FAMILY OF LIGANDS FOR THE TNF *RECEPTOR* SUPERFAMILY
...Abstract: and signal through, their cognate receptors. While the biological role of some of these ligand-*receptor* pairs remains obscure, at least two members of the family, CD40 and Fas, have proven their importance. The *human* X-linked immunodeficiency, hyper IgM syndrome, is the result of mutations in the CD40 ligand...

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Display 5/9,KWIC/11 (Item 2 from file: 440)
DIALOG(R)File 440:Current Contents Search(R)
(c) 1996 Inst for Sci Info. All rts. reserv.
...Identifiers--TUMOR-NECROSIS-FACTOR; T-CELL ACTIVATION; GROWTH-FACTOR *RECEPTOR*; *HUMAN* LYMPHOCYTES-B; X-LINKED IMMUNODEFICIENCY; RECOMBINANT CD40 LIGAND; HYPER-IGM SYNDROME; MOLECULAR-CLONING; FAS ANTIGEN...

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Display 5/9,KWIC/12 (Item 3 from file: 440)
DIALOG(R)File 440:Current Contents Search(R)

05234583 Genuine Article#: MW383 Number of References: 33
Title: 4-1BB T-CELL ANTIGEN BINDS TO MATURE B CELLS AND MACROPHAGES, AND COSTIMULATES ANTI-MU-PRIMED SPLENIC B CELLS
Author(s): POLLOK KE; KIM YJ; HURTADO J; KIM KK; KWON BS (Reprint); ZHOU Z
Corporate Source: INDIANA UNIV,SCH MED,DEPT MICROBIOL & IMMUNOL,635 BARNHILL DR/INDIANAPOLIS//IN/46202 (Reprint); INDIANA UNIV,SCH MED,DEPT MICROBIOL & IMMUNOL/INDIANAPOLIS//IN/46202; INDIANA UNIV,SCH MED,WALTHER ONCOL CTR/INDIANAPOLIS//IN/46202
Journal: EUROPEAN JOURNAL OF IMMUNOLOGY, 1994, V24, N2 (FEB), P367-374
ISSN: 0014-2980
Current Contents Journal Announcement: CC LIFE, V37, N15
Language: ENGLISH Document Type: ARTICLE
Geographic Location: USA
Subfile: SciSearch; CC LIFE--Current Contents, Life Sciences
Journal Subject Category: IMMUNOLOGY
Abstract: 4-1BB is expressed on activated murine T cells and may function

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Display 5/9,KWIC/12 (Item 3 from file: 440)
DIALOG(R)File 440:Current Contents Search(R)

as an accessory signaling molecule during T-cell activation. To identify putative 4-1BB ligands, a fusion protein consisting of the extracellular domain of 4-1BB fused to *human* placental alkaline phosphatase (4-1BB-AP) was constructed. Alkaline phosphatase activity could then be used as an indicator of the relative amount of bound 4-1BB. These studies indicated that 4-1BB-AP specifically bound to the surface of various mature B and macrophage cell lines. 4-1BB-AP bound at low levels to T cell lines (non-activated and anti-CD3-activated), pre-B-cell lines, and an immature macrophage cell line. 4-1BB-AP did not bind to a glial tumor cell line, HeLa cells, or COS cells. In addition, 4-1BB-AP bound at higher levels to F(ab')(2) anti-mu-activated primary B cells compared to anti-CD3-activated primary T cells. Scatchard analysis indicated that the A20 B cell lymphoma expressed 3680 binding sites per cell with a K-d of 1.86 nM. Affinity cross-linking studies demonstrated that a major cell surface species of 120 kDa bound to 4-1BB-AP; 4-1BB-AP also bound to a minor species of approximately 60 kDa.The addition of paraformaldehyde-fixed

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Display 5/9,KWIC/12 (Item 3 from file: 440)
DIALOG(R)File 440:Current Contents Search(R)

SF21 cells expressing recombinant 4-1BB synergized with F(ab')(2) anti-mu in inducing splenic B cell proliferation suggesting that 4-1BB may function as a regulator of B cell growth.
Descriptors--Author Keywords: *4-1BB ; *T LYMPHOCYTE ; B LYMPHOCYTE ; MACROPHAGE ; ADHESION MOLECULES
Identifiers--KeyWords Plus: COGNATE INTERACTIONS; ACTIVATION; *RECEPTOR; * EXPRESSION; LIGAND; PROTEIN; CD40; PROLIFERATION; INTERLEUKIN-2; GENES

...Abstract: 1BB ligands, a fusion protein consisting of the extracellular

domain of 4-1BB fused to *human* placental alkaline phosphatase (4-1BB-AP) was constructed. Alkaline phosphatase activity could then be used...

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